

REMARKS

In response to the above-identified Office Action, Applicants amend the application and seek reconsideration thereof. In this response, Applicants amend claims 1 and 4. Applicants do not cancel or add any new claims. Accordingly, claims 1, 3-4 and 6-10 are pending.

I. Claims Rejected Under 35 U.S.C. §112

The Examiner rejects claims 1, 3, 4 and 6-10 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicants have amended claims 1 and 4 to clarify the claims.

Regarding the rejection of claims 1 and 3, the Examiner states these claims “are incomplete because the definition of X has been deleted by applicant’s amendment.” Applicants have amended claim 1 to include the elements “X is halogen, boric acid or boric ester” to define X. Therefore, Applicants respectfully submit claims 1 and 3 are complete. Accordingly, Applicants respectfully request withdrawal of the rejection of claims 1 and 3.

The Examiner rejects claims 1, 3, 4 and 6-10 stating, “the definition of R₁ and R₂ is inconsistent in initially defining each of R₁ and R₂ as an alkyl group followed by the requirement that at least one of R₁ and R₂ be a polar group containing an ether bond and, in the case of claims 3, 6 and 9, requiring at least one of R₁ and R₂ to contain multiple oxygen atoms.” The Examiner suggested amending the definition of R₁ and R₂ to read, “wherein R₁ and R₂ are identical or different and are independently a straight-chain or branched alkyl group having from 1 to 22 carbon atoms wherein the alkyl group may contain one or more oxygen atoms, provided at least one of R₁ and R₂ is a polar group containing an ether bond.” Applicants have amended claims 1 and 4 to define R₁ and R₂ as the Examiner suggested. Accordingly, Applicants respectfully request withdrawal of the rejection of claims 1, 3, 4 and 6-10.

II. Claims Rejected Under 35 U.S.C. §103(a)

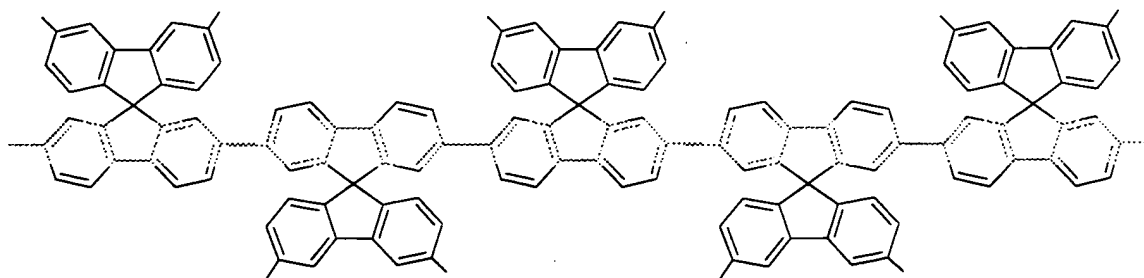
The Examiner rejects claims 1, 3, 4 and 6-10 under 35 U.S.C. 103(a) as being obvious over U.S. Patent No. 6,132,641 issued to Reitz et. al (“Reitz”). Applicants amend claims 1 and 4.

To establish a *prima facie* case of obviousness, the prior art must teach or suggest all of the claim limitations. See MPEP § 2143.03; see also In re Royka, 490 F.2d 981; 180 USPQ 580 (CCPA 1974). Among other elements, amended claim 1 defines a spirobifluorene compound shown in the figure included in claim 1 wherein R₁ and R₂ are identical or different and are independently a straight-chain or branched alkyl group having from 1 to 22 carbon atoms wherein the alkyl group may contain one or more oxygen atoms, provided at least one of R₁ and R₂ is a

polar group containing an ether bond. Applicants respectfully submit Reitz in view of the ordinary skill in the art at the time of the invention does not render independent claim 1 obvious.

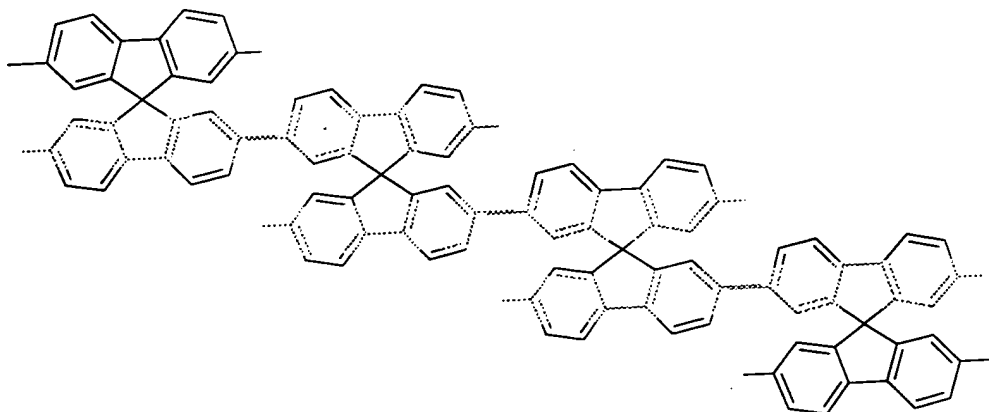
In making the rejection, the Examiner characterizes Reitz as showing “fluorescent polymers of spirobifluorene for use as a light emitting material in an electroluminescence element having the structure of a layer comprising the polymer interposed between a pair of electrodes.” Paper No. 8, page 3. In addition, the Examiner states “the spirobisfluorene repeating units may be substituted with two R groups.” Id. “Suitable R groups include $R_2-(O-C_nH_{2n})_m-O-$ where R_2 is H or C_1-C_{12} alkyl, n is from 2 to 6 and m is from 1 to 12.” Paper No. 8, page 3. “ $R_2-(O-C_nH_{2n})_m-O-$ where R_2 is H or C_1-C_{12} alkyl, n is from 2 to 6 and m is from 1 to 12 provides polar groups containing an ether bond and encompasses 3,6-dioxaheptyloxy (which has the formula $CH_3-(O-C_2H_4)_2-O-$ and 3,6,9-trioxadecyloxy (which has the formula $CH_3-(O-C_2H_4)_3-O-$.” Paper No. 8, pages 3-4. Moreover, the Examiner states, “the polymer can be made from a spirobisfluorene compound substituted with the two R groups and also substituted with two halogens.” Paper No. 8, page 4. Also, the Examiner claims “Reitz’s spirobisfluorene compounds and polymers are position isomers of the spirobisfluorene compounds and polymers of the present claims” and “umbering the carbons of the fluorene rings in the formula shown in present claim 1 such that the X’s are at positions 2 and 7, R_2 is at one of positions 1’ to 4’ and R_1 is at one of the positions 5’ to 8’, Reitz’s compounds represented by prior art formula (IV) as shown in column 6 are compounds in which the X’s are at positions 7 and 7’, and the R groups are at positions 2 and 2’.” Paper No. 8, page 4. Applicants have read Reitz in its entirety and respectfully submit Reitz does not teach or suggest each of the elements of claim 1 as amended.

Regarding claim 1, claim 1 is distinguishable from Reitz since claim 1 defines a fully conjugated structure having continuously alternating double bonds and single bonds. As a result, the compound of claim 1 has a fully conjugated chain as shown in the following structure.



Thus, the above structure has a fully conjugated block that is continuously linked along the main chain of the compound.

In contrast, the polymer taught in Reitz has a non-conjugated linkage at position 9 of the spiro structure. As a result, the polymer of Reitz does not have a fully conjugated structure, but an intermittently conjugated block polymer structure as shown in the following structure.



As shown above, Reitz's conjugated block polymer is intermittently linked via a non-conjugated linkage whereas claim 1 defines a compound having a fully conjugated structure. Thus, Reitz fails to teach or suggest at least these elements of claim 1.

In addition, compounds not having a fully conjugated main chain structures (e.g., the Reitz structure) result in insufficient current flow in the light emitting device's emitting layer. By contrast, compounds having a fully conjugated main chain structure have a sufficient current flow within the emitting layer. This discrepancy is caused by the fact that the current flows along the conjugated block, and the travel length of the charge along the non-conjugated block is shorter than that of the charge along the fully conjugated block. Thus, one skilled in the art knows that this phenomena has considerable influence on the voltage-current characteristics of the light emitting device and that Reitz in view of the ordinary skill in the art does not teach or suggest each of the elements of claim 1.

The failure of the prior art to teach or suggest each of the elements of claim 1 is fatal to the obviousness rejection. Therefore, claim 1 is not obvious over the prior art. Accordingly, Applicants respectfully request withdrawal of the rejection of claim 1.

Claim 3 depends from claim 1 and includes all of the elements thereof. Therefore, Applicants respectfully submit claim 3 is not obvious over the prior art at least for the same reasons as claim 1. Accordingly, Applicants respectfully request withdrawal of the rejection of claim 3.

Regarding claim 4, among other elements, claim 4 defines an electroluminescence polymer having a fully conjugated main chain shown in the figure included in claim 4 wherein R_1 and R_2 are identical or different and are independently a straight-chain or branched alkyl group having from 1 to 22 carbon atoms wherein the alkyl group may contain one or more oxygen atoms, provided at least one of R_1 and R_2 is a polar group containing an ether bond similar to claim 1. Therefore,

Applicants respectfully submit the discussion above regarding Reitz in view of the prior art failing to teach or suggest elements defined in claim 1 is equally applicable to similar elements defined in claim 4. Thus, Reitz in view of the prior art fails to teach or suggest each of the elements of claim 4.

The failure of the prior art to teach or suggest each of the elements of claim 4 is fatal to the obviousness rejection. Therefore, claim 4 is not obvious over the prior art. Accordingly, Applicants respectfully request withdrawal of the rejection of claim 4.

Claims 6-9 depend from claim 4 and includes all of the elements thereof. Therefore, Applicants respectfully submit claims 6-9 are not obvious over the prior art at least for the same reasons as claim 4. Accordingly, Applicants respectfully request withdrawal of the rejection of claims 6-9.

Regarding claim 10, among other elements, claim 10 defines an electroluminescence element comprising a light-emitting layer interposed between a cathode and an anode and containing the electroluminescence polymer as claimed in one of claims 4 and 6-9. Therefore, since claim 10 defines an electroluminescence element including the polymer included in claims 4 and 6-9, Applicants respectfully submit the discussion above regarding Reitz in view of the prior art failing to teach or suggest each of the elements of claims 4 and 6-9 is equally applicable to claim 10. Thus, Reitz in view of the prior art fails to teach or suggest each of the elements of claim 10.

The failure of the prior art to teach or suggest each of the elements of claim 10 is fatal to the obviousness rejection. Therefore, claim 10 is not obvious over the prior art. Accordingly, Applicants respectfully request withdrawal of the rejection of claim 10.

CONCLUSION

In view of the foregoing, it is believed that all claims now pending (1) are in proper form, (2) are neither obvious nor anticipated by the relied upon art of record, and (3) are in condition for allowance. A Notice of Allowance is earnestly solicited at the earliest possible date. If the Examiner believes that a telephone conference would be useful in moving the application forward to allowance, the Examiner is encouraged to contact the undersigned at (310) 207-3800.

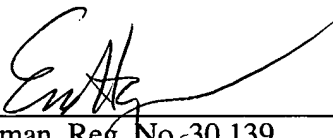
If necessary, the Commissioner is hereby authorized in this, concurrent and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2666 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17, particularly, extension of time fees.

Respectfully submitted,

BLAKELY, SOKOLOFF, TAYLOR & ZAFMAN LLP

Dated: _____

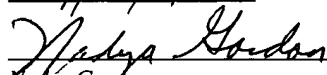
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I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope with sufficient postage addressed to: Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450, on

4/26/04
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